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A GUIDE TO THE

FERNS,

AND MANY OF THE

RARER PLANTS,

GROWING ROUND LUDLOW.

WITH A SHORT PAPER ON THE

Geology of the District.

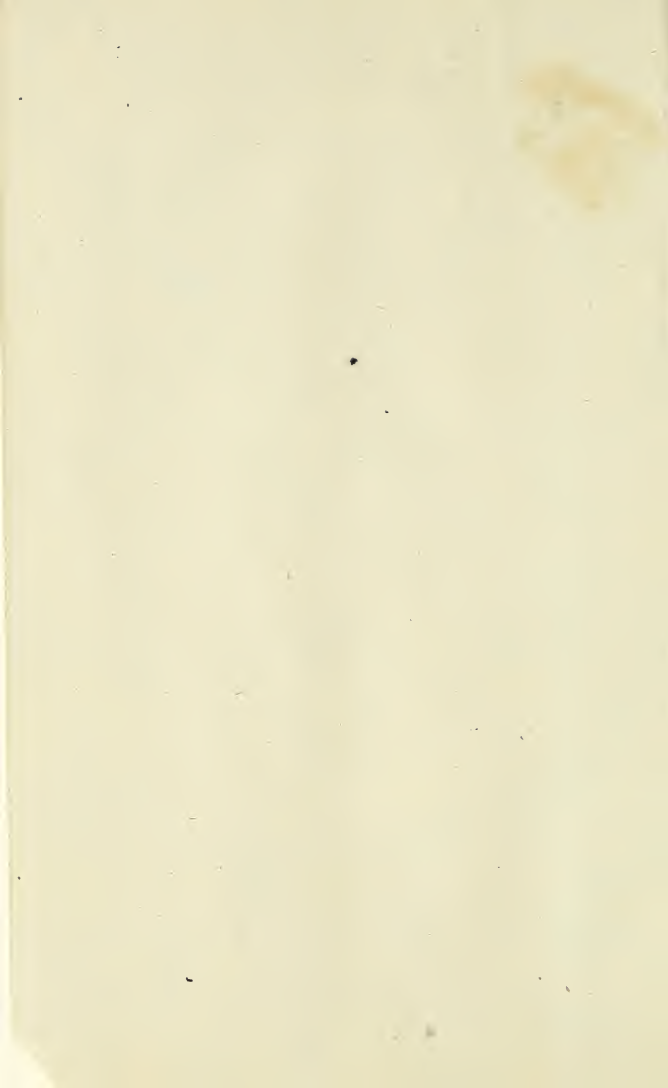
—o—
BY ALFRED MARSTON.

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PRICE ONE SHILLING.

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LUDLOW:

Printed and Sold by G. CRUNDELL, 3, BULL RING.

(1870)



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PREFACE.

The study of Ferns has now become such a favourite subject, (especially amongst the Ladies,) that I think a short guide, to the best localities of those growing in this District, may not be unacceptable to the Inhabitants and frequenters of this beautiful neighbourhood. I shall mention the best places for a collector to visit, who is in search of these interesting plants, with a few remarks upon their adaptability for rock-work or pot culture, and leave to abler pens than mine, the task of describing their specific characters, which information may be readily acquired in the many books written upon the subject by Mr. Moore.

With the guide to the Ferns, is also one to several of the rarer Plants, kindly furnished me by a friend, who thoroughly understands them. If this imperfect sketch, shall cause others to search, and discover new species or varieties, I shall be more than rewarded for any trouble I have taken.

In conclusion, let me beg that those who may collect, will shew a little mercy, and not take more than they actually require, as too often the localities of rare plants, are entirely destroyed by over eagerness to possess all that are seen growing.

Bull Ring, Ludlow, 1870.

LIST OF FERNS.

POLYPODIUM VULGARE,

Common Polypody.

A very common species, growing upon old walls, rocks, trunks of trees, and thatched roofs, some fine fronds are in the lane at the back of Hucks Barn, on the sides of the lower coppice wood, and at Burrington, but it is abundant everywhere, and being an ever-green plant, is very suitable for rock-work, on which it grows readily.

POLYPODIUM PHEGOPTERIS,

Beech Fern.

A rather rare species, growing generally in damp woods, or moist mountainous situations; a fragile plant, to be found from June until October, but generally killed by the first frost. It may be found in Maryknoll Dingle near to the Keeper's House; also on the side of the cart road through the wood (leading from the back of Mr. Coston's Farm House, in the direction of the Pools Farm;) just beyond the first Holly Tree; and very abundantly near the River Onny, amongst the loose stones on Longville Common. It is a delicate and graceful Fern for rock-work or Wardian Cases, and requires plenty of percolating moisture.

POLYPODIUM DRYOPTERIS,

Oak Fern.

A rather common Fern in this Neighbourhood, growing in the drier parts of the woods and hilly situations; a very delicate plant. It grows luxuriantly all up Maryknoll Dingle, especially near to the Keeper's House, and at the upper end of the valley by the side of an old cart road, where there are large patches of it; also about a mile beyond the Fountain in the lower wood, on Longville Common, and on the sides of the Longmynd hill valleys. It grows well on rock-work, for which it is very suitable if planted in a cool shady situation.

ALLOSORUS CRISPUS,

Parsley Fern.

A scarce Fern and difficult of cultivation, growing in mountainous stony situations, during the summer months; the only situation for it near Ludlow being on the Clee Hills, but it is now rare there, being nearly eradicated from the spot by over zealous botanists. It grows abundantly near to Llandrindod.

POLYSTICHUM ACULEATUM,

Common Prickly Shield Fern.

A common evergreen Fern, in hedge rows, and on steep banks, it is a very attractive rock-work plant. There are some fine roots at the upper end of Maryknoll dingle on the sides of an old watercourse, also

a short distance up a foot path leading into the wood from the lower coppice road, close to an old quarry, about a mile from the Pools Farm; on the sides of Halton Lane; in Downton Castle walks; near to the Leysters Pole; besides many other places.

POLYSTICHUM ANGULARE,

Soft Prickly Shield Fern.

A rather common evergreen, growing in hedge-banks and lowland woods, preferring plenty of free but not stagnant water. It is found in Maryknoll dingle; in the path in the lower wood as mentioned for the previous Fern; in the Downton Castle walks; and in many other situations. There are several varieties of this Fern, all of which are most suitable for rock-work.

LASTREA THELYPTERIS,

Marsh Buckler Fern.

This is a very rare Fern in this district; the only locality I know of is in the boggy ground near Burrington Pool.

LASTREA SPINULOSA,

Crested Buckler Fern.

This is a variety of the Lastrea Cristata one of our rarest British Ferns; it is to be found, I believe, near the cart road at the back of Mr. Coston's Farm House, and also in the woods near Ferney Hall. It prefers damp boggy ground.

LASTREA MONTANA,

Mountain Fern.

An elegant tall species, to be found abundant in many places in Maryknoll woods, especially a little distance up a cart road immediately opposite the Keeper's House in the dingle. There are some very fine plants at the back of Mr. Coston's House, and near to a Limestone quarry on the Wigmore road; it is also abundant on the Titterstone Clee Hill. This Fern gives out a peculiar balsamic fragrance when drawn through the hand, it grows well on rock-work.

LASTREA FILIX-MAS,

Common Male Fern.

Abundant everywhere, some very fine fronds are on the sides of the Downton Hall drive. There are several roots of the variety *Cristata* growing on the sides of the lower coppice road, just beyond the first cottage, and also in several other places near Ludlow. This Fern is one of the easiest to cultivate, and is suitable for shady rock-work.

LASTREA DILATATA,

Broad Buckler Fern.

A very elegant Fern, and found abundantly in Maryknoll woods; the finest fronds are at the back of Mr. Coston's Farm House, where they grow three or four feet high, there are also some very fine ones in Maryknoll dingle, and near the lower coppice road. It is partial to damp, shady woodlands, and hedgebanks, a hardy Fern, and easily cultivated.

ATHYRIUM FILIX-FÆMINA.

Lady Fern.

One of the most elegant of our native Ferns, growing abundantly in moist warm woods and hedgerows, common everywhere in this neighbourhood; a very pretty variety *Rhoceticum* which has its pinules much narrower, and the lower part of the stem a light red colour; may be found near the Fountain in the lower wood, and in several other places. This Fern is readily cultivated, it prefers a rather boggy soil, and loves shade and moisture, it is the most beautiful of all rock-work Ferns.

ASPLENIUM RUTA-MURARIA.

Wall Rue.

A diminutive plant, found growing on old walls and rocks; it is very abundant upon Henley Bridge; on the bridges at Ashford and Bromfield; and on the wall in Corve Street, immediately opposite the burial ground; at the latter place there are some very fine roots; it is rather a difficult plant for cultivation.

ASPLENIUM TRICHOMANES.

Maiden Hair Spleenwort.

A pretty small Fern, growing in tufts, in the crevices of rocks and walls; abundant in this locality; some fine fronds are on the rocks by the river side under Whitcliffe; and in the Downton Castle walks. It is rather difficult to transplant, but when once established grows readily in pots, or on rockwork, it does not require much moisture.

ASPLENIUM ADIANTUM-NIGRUM.

Black Maiden Hair.

An elegant dark evergreen Fern, occuring on rocks and walls, not very common, it may be found on a small rock at the back of Hucks Barn in the old lane to Overton; on some lime-stone cliffs nearly immediately above the keeper's house in Maryknoll dingle; and close to the cave on Norton's Camp. A most useful Fern for shady rock-work, as it grows freely if planted in sandy soil, and kept slightly moist.

SCOLOPENDRIUM VULGARE.

Hart's Tongue.

A common species in many localities, growing most luxuriantly in the Downton Castle walks; near to the Bow Bridge; in the Well in Ludlow Castle; and on the river bank just beyond the outlet of the sewers, close to the old Paper Mills. The variety *Crispum* occurs on the side of the road, a short distance from the Brakes Farm. This is a very pretty plant for rock-work, its simple fronds contrasting well with the other kinds. It requires plenty of moisture.

CETERACH OFFICINARIUM.

Scale Fern.

A pretty dwarf evergreen Fern, growing upon old ruins, and in rocky situations; it is not very abundant. May be found on Ludford bridge; on Ashford bridge; on the ruins of Ludlow Castle; and on the Town wall in Frog Lane, it grows most luxuriantly when planted in the open ground.

BLECHNUM SPICANT.

Hard Fern.

A curious plant, producing two distinct fronds, a fertile and a barren one, it is common on Whitcliffe, and in the neighbouring woods. A free growing plant, and easy of cultivation.

PTERIS AQUILINA.

Common Brake.

Abundant everywhere, in many places it grows higher than a Man's head, very tall in the Hay Park. Not suitable for rock-work.

CYSTOPTERIS FRAGILIS.

Brittle Bladder Fern.

A very pretty small Fern, occuring in few places in this district, the most abundant locality is in the beautiful Downton Castle grounds, where also the varieties Dentata and Augustata grow ; it also is to be found on Whitcliffe amongst the cliffs facing the river, and rarely in Maryknoll woods. A manageable plant under cultivation, and growing readily in pots or on rock-work.

OSMUNDA REGALIS.

Royal Fern.

This is a most magnificent species, often growing eight or ten feet high, the only locality where it has been found near Ludlow, is on the Clee Hills ; it grows abundantly near Shawbury in Shropshire. In cultivation it should occupy the dampest parts of the rock-work.

BOTRYCHUM LUNARIA.

Moon Wort.

A small but distinct plant from three to eight or ten inches high, occurring in open heaths and pastures, where the soil is dry and peaty or sandy; it is not an abundant Fern, but has been found on Whiteliffe; on Brindgewood Chase; and on the Common near Richard's Castle. It is difficult to transplant, and does not readily grow under cultivation.

OPHIOGLOSSUM VULGATUM.

Adder's Tongue.

A small stemless plant, very abundant in damp meadows, it may be collected readily in the field below the summit of Maryknoll; and just over the foot bridge crossing the river Ledwyche, near the Sheet House. Easily cultivated if planted in a stiff loamy soil, and supplied with plenty of water.



LIST AND LOCALITIES

OF THE

RAREST FLOWERS.

Astrantia Major. N.O. *Umbelliferæ.*

A very elegant plant, of a white or slight yellow colour, found at the top of View Edge, in the wood. Very rare.

Anagallis tenella. Nat. Order *Primulacæ*; *Bog pimpernel.*

A small creeping plant, with comparatively large pale pink flowers, found in the marshy ground at the foot of the High Vinnall Hill. Rather rare.

Aconitum napellus. Nat. Order *Ranunculacæ.*
Common Monkshood.

A doubtful native, well known as a showy garden plant; found growing freely and apparently quite wild on the banks of the river Ledwyche, near to Caynham. Very rare.

Cnicus erioptiorus. Nat. Order *Compositæ.*

Perhaps the most handsome of our native thistles, not alone from its flower, but from the head of seed and its leaf; it grows round the foot of Caynham Camp. Rather rare.

Campanula patula. Nat. Order *Campanulacæ.*
Open flowered bell flower.

A pretty and rather tall growing plant, and much more elegant than many of the campanulas; found tolerable plentifully around Onibury.

Wahlenbergia hederacea. Nat. Order *Campanulaceæ.*
Ivy leaved bell flower.

A rather inconspicuous but elegant flower, found in the marshy ground between the Titterstone and Hoar Edge. Decidedly rare.

Drosera rotundifolia. Nat. Order *Droseraceæ.*
Round-leaved Sundew.

The leaves of this plant are fringed with long red glandular hairs, the flowers are white; to be found in the same locality as the preceeding plant. Rare.

Paris quadrifolia. Nat. Order *Tilliaceæ.*
Herb Paris.

A singular plant, with four leaves all on the same level, with a single lurid purple flower, it occurs in the Whitcliffe woods, and near Brick House. Very rare.

Butomus umbellatus. Nat. Order *Alismacæ.*
Flowering Rush.

A water plant, growing on the edge of the River beneath the Whitcliffe; it seldom flowers here. Rather rare.

Triglochin palustre. Nat. Order *Alismaceæ*.
Arrow Grass.

A very curious grass-like plant, occurring in the fields beneath the north end of the Castle. Rather rare.

Sambucus ebulus Nat. Order *Caprifoliaceæ*.
Dwarf Elder, or Danewort.

A low growing shrub, with a more showy flower and fruit than the common elder; found near Burrington. Rare.

Dipsacus pilosus. Nat Order *Dipsacacæ*.
Round headed Teasel.

A much weaker and less conspicuous plant than the ordinary Teasel, it grows on the banks of the Corve River. Rare.

Bartsia Alpina. Nat. Order *Scrophulariaceæ*.

A singular plant, said to be parasitic on Clover, it has a very woody stem, and a dense spike of flowers of a dusty purple colour; found near the Lodge, in a dry lane. Rare.

Hypericum androsænum. Nat. Order *Hypericaceæ*
Tustan.

Our finest St. John's wort, growing on the south side of the Brindgewood range, and also near Woofferton. Rare.

Genista anglica. Nat. Order. *Legnminosæ.*
Petty Whin.

To be found at the foot of the North face of the High Vinnall. Rather rare.

Geranium sylvaticum. Nat. Order. *Geraniaceæ.*

A very beautiful flower, it is found scattered through most of the woods near Ludlow. Rare.

Spiranthes autumnalis. Nat. Order. *Orchidaceæ.*
Lady's Tresses.

A curious looking plant, about five inches high, with greenish white flowers arranged in a spiral spike ; found near Stanton Lacy. Rare.

Neotia Nidus-avis. Nat. Order. *Orchidaceæ.*
Bird's Nest orchis.

This plant is found in the damper and shadier portion of the Whitcliffe woods. Rather rare.

Narthecium Ossifragum.—*Bog Asphodel.*
 Boggy places on the Clee Hill.

Veronica Anagallis.—*Marsh Speedwell.*
 Same locality as last.

Pedicularis Palustris.—*Tall Red Rattle.*
 The same locality.

Viola Lutea.—*Yellow Violet.*
 On the grassy top of the Clee Hills.

Campanula Hederacea.—*Ivy leaved Campanula*.

Near the foot of the Clee Hill.

† *Scutellaria minor*.—*Lesser Scull Cap*.

The same locality as last.

Alyosotes Versicolor.—*Yellow and Blue Scorpion Grass*.

Same locality as last.

Dianthus Armeria.—*Deptford Pink*.

Near Greet and Ashford.

Dianthus Caryophyllus.—*Clove Pink*.

Ludlow Castle Walls.

Priola Rotundifolia.—*Round-leaved Winter Green*.

Maryknoll Dingle.

Ornithopus Perpusillus.—*Birds-foot Trefoil*.

Maryknoll Woods.

Orchis Viridis.—*Frog Orchis*.

Damp meadows near Whitton.

Orchis Apifera.—*Bee Orchis*.

Near Corely.

Orchis Befolia.—*Butterfly Orchis*.

Between Whitton and the Knowl.

Helleborus Viridis.—*Green Hellebore*.

Near Easton Court.

Hyoscyamus Niger.—*Black Henbane*.

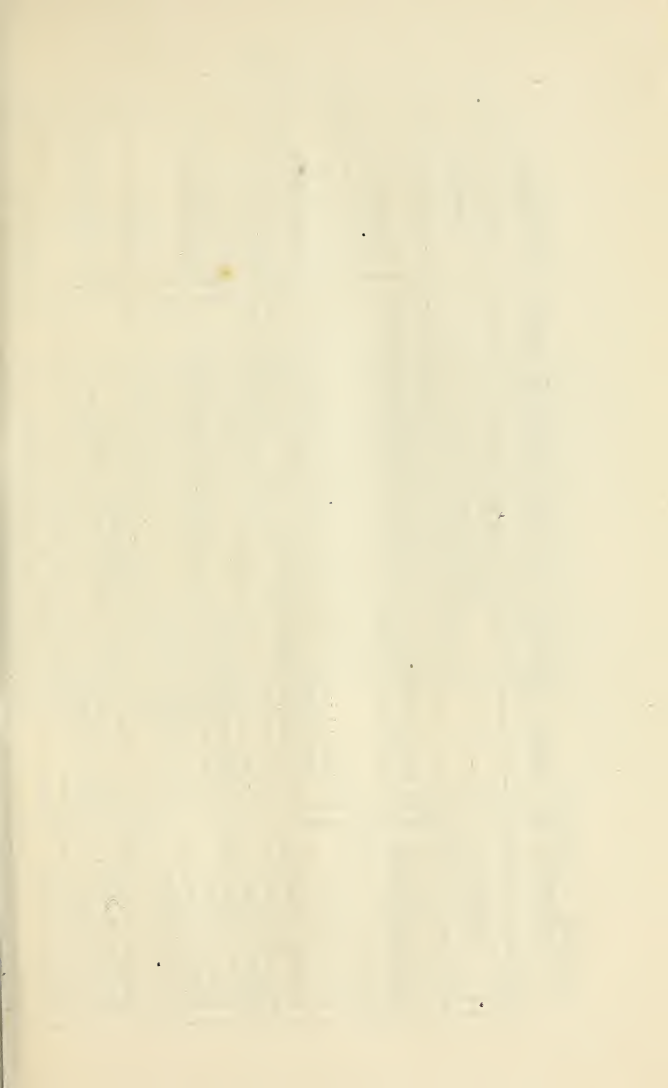
Near to Greet.

Epipactis Catefolia.—*Broad-leaved Hellebore*.

Near Greet.

Atropia Belladonna.—*Deadly Night-shade*.

Richard's Castle.



SECTION OF ROCKS EXPOSED IN THE DISTRICT ROUND LUDLOW.

NAME.	DESCRIPTION.	SYSTEM.
Old Red Sandstone {	A fine grained micaceous sandstone, containing bands of impure concretionary limestone, called cornstone .	Devonian.
Tin Mill Shale .	Different coloured thin beds, containing fish and crustacean remains	Passage Beds.
Downton Sandstone {	Fine grained yellow sandstone	
Upper Ludlow .	Micaceous grey argillaceous rock	Upper Silurian.
Aymestry Limestone .	Argillaceous limestone	
Lower Ludlow .	Thin bedded mudstone, containing beds of limestone .	
Wenlock Limestone .	Concretionary limestone	
Wenlock Shale .	Blue argillaceous shale	
Pentamerus Limestone	Thin bands containing Pentamerus	Lower Silurian.
Caradoc Sandstone .	Fine grained yellow and white shelly sandstone . .	
Bala Limestone .	Hard calcareous	
Longmynd Rocks .	Hard slaty rocks containing very few fossils	Cambrian.

A

SHORT GEOLOGICAL GUIDE,

ROUND LUDLOW.

THE district around Ludlow is most interesting to a student in Palæozoic Geology, as it lies in almost the very centre of those formations. Upon the north-east and south-east sides, the Old Red Sandstone stretches out, in a nearly continuous plain, for many miles, except where it is broken up by the upheaval of the Titterstone and Brown Clee Hills, and a few minor ones; and upon the west, the Silurian rocks are well exposed in many fine and extensive sections. As my space is very limited, I shall only be able to notice a very few of the fossils deserving mention; but trust to name those that are most interesting, and characteristic of the different formations occurring in this neighbourhood, and also the best places to procure them, in a series of different walks and rides round Ludlow.

WALK No. I.

Ludlow stands upon two different formations, the Old Red Sandstone, and the Upper Ludlow; the junction beds between them run nearly straight up Old Street, the different rocks of which were well exposed during the recent excavations for draining the town.

The Tin Mill Shale beds which are a part of these Junction beds, and the lowest members of the Red Sandstone formation, were readily to be examined while the Shrewsbury and Hereford Railroad was being con-

structed, in the deep cutting close to the south-east end of the Ludlow Tunnel, were they were first noticed by R. Lightbody, Esq. Many of the beds are very full of fossils, the principal of which are two new *Cephalaspis*, viz., *Ornatus* and *Murchisonia*, the new genus *Auchenaspis Salteri*, the large crustaceans *Pterygotus Ludense*, and *Banksii*, also *Eurypterus pygmaeus*, *megalops*, and *accuminatus*; fish spines, *Berychia Klodeni* and *Lingula cornea*, also occur in great abundance.

Underneath Ludlow Castle the upper Ludlow rock is exposed, from whence several very fine specimens of the large trilobite *Homalonotus Knightii* have been obtained by Mr. Cocking. Immediately over Dinham Bridge, and almost facing it, is a small section of the uppermost Aymestry Limestone, full of fossils, some of which are the scarce crustacean *Ceratiocaris robustus*, several species of trilobites, of which *Encrinurus punctatus* and *Proetus Stokesii* are the most common; *Lichas Bucklandii* also occurs here rarely, but the following shells are pretty numerous, *Ecculiomphalus laevis*, *Pterinea lineatula*, *Lingula striata*, *Rhynchonella navicula*, *Strophomena depressa*, and *filosa* (the last a very characteristic fossil of the upper beds of this formation); the coral *Stenopera fibrosa*, and a small variety of *Graptolithus priodon*, are also to be procured.

Whitcliffe Hill is principally composed of the upper Ludlow rock, a large quarry of which stone is immediately opposite Mill Street, full of vast numbers of shells. The most productive situation is on the flat surface of the cliff, immediately above the footpath, in thin bedded stone. Some of the remains found here are *Pterygotus problematicus* and *punctatus*, *Spongarium Edwardsii*, *Murchisonia articulata*, *Discina rugata* and *striata*, *Chonetes lata* with perfect spines, a new species of *Pterinea*, *Theca Forbesii*, *Bellerophon expansus*, and *Orthoceras bullatum*, *ibex*, and *perelegans*. In the blue

beds in this quarry one or two specimens of *Pteraspis Ludensis* have been found.

At the upper end of the section in Ludford Lane I have obtained several fragments of *Homalonotus Knightii* and *Conularia Sowerbyi*. A little lower down the lane is the famous Ludlow bone bed, until lately considered to mark the dawn of vertebrate life; it is almost entirely composed of fish and crustacean remains. On this horizon we first find relics from the land, in the shape of small seeds or spores of some cryptogamic plant. About a foot below the bone bed *Eurypterus pygmaeus* and *acuminatus* occur, and immediately above is a layer of very thin bedded stone full of fragments of *Pterygotus Banksii*; a little higher up the rock is the *Platyschisma helicitis* bed, in which several masks of either *Pteraspis* or *Cepalaspis* have been found. I consider this bed as the line of demarkation between the Upper Ludlow and Downton sandstone. Many other fossils may be found here, such as *Beyrichia Klodinii*, *Lingula minima*, *Holopella obsoleta*, *Cucullella antiqua*, *Spirifer elevatus*, and *Orthoceras tracheale*. The Downton sandstone is exposed at the lower end of the lane, resting conformable upon the underlying rock; it is in general a very barren formation, and for that reason has received but little attention from geologists. It contains little else in this neighbourhood than fucoidal and carbonaceous impressions, and a very abundant small *Lingula* (*cornea*); still it is worth examining, as several fish-heads and large portions of *Pterygotus* have been collected from it.

WALK No. II.

A little distance through the Turnpike Gate, near to the New Bridge, is a large Upper Ludlow quarry, containing an abundance of fossils, and as it is often worked, there is generally a quantity of loose stone in

the bottom, which makes it a very good place for searching for them. Here a species of *Spongarium* is abundant, also the common Upper Ludlow coral *Stenopora fibrosa*, and the worm tubes *Serpulites longissimus* and *Trachyderma coriacea*, the shells *Goniophora cymbæformis*, *Crania implicata*, *Chonetes lata*, *Orthonota amygdalina*, *Orthis elegantula*, and several species of *Orthoceratites*; one or two specimens of the rare *Ascoceras Barrandii* have also been found at this place.

On the south side of Oakly Park, just above Hill Halton, is a small quarry excavated in the red marly beds that lie underneath the cornstones of the Old Red sandstone, which beds contain a small *Cephalaspis*, probably *Cephalaspis Lyellii*. This is the only place I know of where these red marly beds have yielded any organic remains.

WALK No. III.

On the right bank of the river Teme, immediately facing the Paper Mills, the Tin Mill beds or their equivalents are exposed, but probably occupying a higher horizon than those in the railroad cutting. From the hard grey micaceous grit-band, full of carbonaceous markings, have been procured *Cephalaspis Murchisonii*, a very large species of *Lingula cornea*, and large *Onchus spines*.

Near to Saltmore is a very prolific Upper Ludlow quarry, from it I have collected several fragments of *Pterygotus*, and most of the usual fossils of this formation.

In the Old Road, at the back of Huck's Barn, the Upper Ludlow rock is exposed, but is not very productive. Here grows luxuriantly the pretty fern, *Asplenium Adiantum-Nigrum*. In a small quarry in Ludford Park, on the site of the old turnpike road,

Cophinus Dubius is to be found in abundance in the worm bed. This strange fossil, looking like an inverted cone, is caused by the rotatory motion of Encrinite stems in the quickly deposited mud of the sea bottom. Nearly at the top of the cliff some small specimens of the trilobite *Calymene Blumenbachii* occur. From the old park wall some very perfect specimens can be procured, as the upper stones are in a very perishable condition, and so allow the fossils to be obtained in a very entire state, often preserving the sharpness of their forms, and remains of their original shelly covering. At the lower end I have found several good heads of *Homalonotus Knightii*, and nearly perfect specimens of *Orthoceras bullatum*, *ibex*, and *perelegans*, *Ecculiomphalus lævis*, *Pterinea lineatula*, *Orthonota amygdalina*, and *Goniophora cymbæformis*; and about 100 yards higher up, a large and perfect jaw-foot of *Pterygotus*, the largest portion that had then been found in this neighbourhood.

The Downton sandstone is exposed at the lowest end of the road, but contains very little of interest. The Ludlow bone bed should be looked for here, as there is a nearly continuous succession of beds from the Downton sandstone to the middle of the underlying rock. Fine specimens of the *Asplenium Trichomanes* grow here.

WALK No. IV.

This walk is entirely over the Old Red sandstone, and leads us to the best localities in this neighbourhood where we can obtain the fossils of this formation, as near to Whitbatch are several bands of limestone, called Cornstone, exposed, in which the best preserved fish remains are found.

In a field just above Whitbatch Coppice, on the

right-hand side of the main road, is a very favourite quarry of mine, some beds of which are very productive, especially the bottom of the bed, overlying the cornstone. From this place I have procured one nearly entire specimen of the old fish, *Cephalaspis Lyellii*, several fine heads of the same species, and a few shields of *Pteraspis* in a good state of preservation.

On the opposite side of the valley is another quarry, from whence a spiny stem of a plant has been procured by R. Lightbody, Esq., and several of the strata are full of large fucoidal impressions. In the drive leading to Downton Hall, by Targrove, the lower cornstones are exposed in a deep cutting, and contain *Pteraspis rostratus*, *Cephalaspis Lyellii*, egg packets of *Pterygotus*, and fucoidal remains. About a mile and a half to the north-east of this place, near to the Birches farm, is another most productive quarry for *Pteraspis Crouchii* and *Lloydii*. Near Hayton's Bent I found a small portion of *Cephalaspis asterolepis*, the largest of the *Cephalaspides*, and near Hopton's Gate, Dr. J. Harley procured several portions of *Pterygotus*.

At the village of Bouldon, about three miles to the north of Hayton, the cornstone is again well exposed; the most productive section is just above the Old Furnace. *Pteraspis* and *Cephalaspis* are here most abundant, and many of the quarried stones are covered with impressions of carbonaceous remains, probably fucoidal, and I have generally observed that fish remains are most numerous where these most abound. At the bottom of the grey micaceous flaggy stones, which lie just above the lowest band of cornstone here exposed, casts of fish or crustacean tracts are found covering all the under surface of a smooth argillaceous bed, overlying a thin bed of clay, on which the impressions were made. They look like parallel rows of short elevated lines, sharp at one end, and in the

best preserved specimens a furrow runs up the centre, looking as if made with the tail or body of the animal.

A little distance to the east of the Wood House, in the centre of a small circular patch of cornstone, is a shallow quarry, in which *Pteraspis Crouchii* is most abundant, and I have also obtained several portions of *Cephalaspis Lyellii*.

I hope that this brief guide to the fossil-bearing localities of the Old Red sandstone in this district may lead others to search for the relics of these ancient seas, as there is a wide field for discovery, many places in this neighbourhood having had but a very cursory examination by geologists.

WALK No. V.

There are several quarries of Aymestry limestone on the side of the road leading to Wigmore, where it passes through the wood. Those nearest to Ludlow belong to the upper members of this formation, and from them some very perfect specimens of the following fossils have been obtained: *Orthoceras ibex*, *perelegans*, *subundulatum*, *virgatum*, and *gregarium*, *Bellerophon expansus*, *Discina rugata* and *striata*, *Ecculiomphalus laevis*, *Murchisonia corallii*, *Cyclonema corallii*, a new species of *Natica*, *Pterinea retroflexa*, and several others.

About half way through the wood is a fine section of the Lower Aymestry limestone, and from it I procured one very beautiful specimen of the large *Bellerophon dilatatus*. *Lingula Lewisii* is here very abundant and perfect, often being found with both the valves entire. *Trachyderma squamosa* occurs here in great numbers, and of a very large size; also most of the usual forms.

The Lower Ludlow rock is exposed in a fine section for some distance down the stream that flows at the bottom of Sunny Gutter, below Maryknoll. One of the

most productive places is at a low cliff on the right bank of the brook, almost immediately facing a farmhouse on the top of the hill. Here the trilobite *Phacops caudatus* is most abundant, with its eyes very perfect, and in their proper position in the head; also two new specimens of *Graptolithus*, together with the shells, *Orthoceras subundulatum*, *Ctenodonta sulcata*, *Cardiola fibrosa*, a new *Lunulocardium*, and many others.

Just beyond the gate leading into the wood, on the right of the brook, a small section is exposed on the side of the footpath, from whence I have procured the scarce trilobite *Cyphaspis megalops*, and a new branched coral; the latter was first found by the Rev. J. D. La'Touche, near Stokesay.

Close to the keeper's house, at the back of Mr. Bridges, of the Lodge, the fern *Polypodium phegopteris* grows; and all down the valley, *Polypodium dryopteris* occurs in profusion, together with *Lastrea dilatata*, *Blechnum spicant*, and most of the common kinds.

A little distance above the house is an Aymestry limestone quarry, and just above one of Upper Ludlow. I do not know a better place than the latter for finding *Discina rugata* and *striata*, *Pterinea lineatula*, *Pterinea* (new species), *Cucullella antiqua*, *Ctenodonta Anglica*, *Bellerophon expansus*, and *Orthoceras perelegans*; besides these *Pterygotus problematicus*, head of a *Limuloides*, *Ceratiocaris robustus*, *Theca Forbesii*, *Ascoceras Barrandii*, *Natica parva*, *Orthonota rigida*, and *Orthoceras imbricatum* occur, but are much more rare. The view from this spot, looking up the deep narrow dingle, with its well wooded sides, and in the distance, right and left, the hills of Bringewood Chase and High Vinnall, is a most splendid one. I only wish that I could persuade the lover of the beautiful and picturesque to pay a visit to the many charming views in and about this dingle.

WALK No. VI.

The walk this day leads to the High Vinnall hill, which is almost entirely composed of Lower Ludlow rock ; one fine section is exposed in a quarry on the west side near the summit ; the beds here are of a thin slaty nature, and contain but few fossils of much interest. A small species of *Graptolite* occurs here in profusion, and *Lingula lata*, *Leptaena* or *Chonetes laevigata*, and *Orthoceras subundulatum*, may be found. I once obtained from here two very perfect specimens of the rare cephalopod, *Lituities articulatus*, and from the cutting in the cart-road just behind this quarry, one specimen of *Cyphaspis megalops*. A most splendid section of Lower Ludlow may be examined about a mile from here, in Elton and Evenhay's Lane. In some of the beds near to a cottage, about half way down the road, portions of *Phacops caudatus* swarm ; heads and tails are most numerous, and in the former the eyes are often preserved in a perfect condition, but I have never found an entire specimen here. A new species of bent *Graptolite* is pretty common in these beds, and *Acidaspis coronatus* and *Phacops Downingii* should be looked for, several of each having been found. The Shells *Loxonema elegans*, *Lunulucardium* (new species), several species of *Orthoceratites*, *Murchisonia Lloydii*, *Ctenodonta sulcata*, *Lituities giganteus* and *tortuosus*, *Cardiola interrupta*, *fibrosa*, and *striata*, with many other new and rare forms, are in this lane to be procured. At the lower end of the lane are two small quarries of Wenlock limestone, but they are very barren in fossils.

I trust that all collectors of fossils will pay this place a visit, as there is no other in the neighbourhood of Ludlow where so fine a section of this rock is exposed, and where so many rare fossils, and in such a good state of preservation, can be so easily collected.

WALK NO. VII.

A little distance up a lane, through the coppice leading to Bringewood Hill, is a small quarry of Lower Ludlow, from whence I obtained a very perfect *Lituites articulatus*, but the rock is in general very barren.

At the village of Burrington the Wenlock shale is very well exposed in many deep cuttings in the different roads; several of the beds are full of the trilobite *Calymene tuberculosa*. *Graptolithus priodon* also abounds, and several small shells. *Bellerophon dilatatus* has been found in a quarry to the north of the Church; also one specimen of the very scarce *Ampyx parvulus*. *Phacops longicaudatus* is also here, but the best place for them is in the bed of the river Teme, a short distance below Crifton Bridge, where they can be found in great abundance, and in very good preservation.

Close to Downton Castle Bridge, on the right bank of the river, the Ludlow bone bed is exposed, containing its usual remains; *Onchus* spines are very fine here. About three feet higher up the rock, in the *Platyschisma* bed, I obtained several heads of a small *Cephalaspis* or *Pteraspis*, covered with very small tubercles. The walk from here to the Bow Bridge, by the side of the river, which rushes through a deep narrow gorge formed in the Upper Ludlow rock, is a most delightful one, and alike interesting both to the geologist and botanist. In the grounds near to this walk, more than twelve species of ferns are to be met with, including *Scolopendrium vulgare*, the beautiful hanging fronds of which in many places cover the high cliffs; *Polypodium vulgare*, *dryopteris*, and *phegopteris*; *Cystopteris fragilis*, *angustata*, and *dentata*; *Asplenium Adiantum-Nigrum*; *Polystichum aculeatum*, *angulare*, and *lobatum*, and *Blechnum spicant*. The section by the

side of the river, to Bow Bridge, is well worth inspection, as there is a continuous series of beds from the Downton sandstone to the Lower Ludlow. The Aymestry limestone is exposed in a very high cliff at the Bow Bridge, and there I found a few specimens of *Lingula Symondsii* and *Lingula cornea*. Nearly at the extremity of the rock here exposed, close to a small stream that flows down a deep gully, is a small cliff, the beds of which are of a very hard nature, splitting into thick slaty masses of a deep olive colour, and contain several rare fossils, such as many different species of *Fucoids*, two species of beautiful branched *Graptolite* spines of either star-fish or echinus, and *Conularia bifasciata*.

Near Forge Bridge some very fine sections of Downton sandstone are exposed; from them have been procured some very perfect heads and portions of the body of *Pterygotus Banksii*, and *P. problematicus*, and some large slabs covered with Lycopodiaceous seeds, and containing large portions of carbonized wood.

In the old Tin Mill Race, a little distance below the cottage, beds equivalent to those in the railway cutting are exposed, containing, in addition to their usual fossils, a small new *Modiolopsis* and a new *Orthonota*. Immediately on the opposite side of the river the same beds can be examined very full of fish remains.

Returning through the wood above Brick House farm, on the road to Ludlow, is a small quarry of upper Aymestry limestone, containing, in great abundance, *Ecculiomphalus laevis*, *Loxonema sinuosa*, *Holopella gregaria*, and *Mytilus mytilimeris*. There also occurs here but not so numerously, remains of *Pterygotus*, *Ceratiocaris*, and a small *Trilobite*. There are several Upper Ludlow and Aymestry limestone quarries on the side of the road from here to Ludlow, all full of fossils, and close below Whitcliffe Coppice gate the bone bed may be again examined.

WALK No. VIII.

A short distance below the foot bridge that crosses (near to the Sheet House) the river Ledwyche, is a small section of Tin Mill Shale exposed on the side of the stream, containing *Beyrichia*, *Lingula cornea*, *Leperditia marginata*, a new species of *Modiolopsis*, and numerous fish fragments.

Close by the summit of Caynham Camp is a large Aymestry limestone quarry, containing, along with other fossils, *Strophomena depressa*, *Murchisonia corallii*, *Euomphalus alatus*, *Rhynchonella didyma*, *Wilsoni* and *navicula*, *Atrypa reticularis*, and *Stenopora fibrosa*. *Orthoceras angulatum* has been found here, but it is very scarce.

WALK No. IX.

On the Common, near to Batchcott, opposite the Moor House, are two extensive quarries of Upper Ludlow rock. From the uppermost beds of the one farthest to the south, several good heads and tails of *Homalonotus Knightii* have been procured; *Pterygotus* and *Ceratiocaris* also occur, but very rare. In the upper section I have found a few specimens of the rather scarce fossil, *Cyrtoceras compressum*. From either of these quarries may readily be procured, in a good state of preservation, most of the characteristic species peculiar to the formation. At the Bony Well is a small escarpment showing the transverse symmetrical joints so peculiar to this rock. Old Drayton thus wrote of this well:—

“ With strange and sundry tales,
Of all their wondrous things, and, not the least, in Wales,
Of that prodigious spring (him neighbouring as he past)
That little fishes’ bones continually doth cast.”

There are several other sections of Upper Ludlow and Aymestry limestone exposed further south, well

worth inspection, as I have no doubt that many valuable remains might be obtained for the benefit of science and the increase of our knowledge of the inhabitants of these old seas, by a persevering search.

WALK No. X.

On the sides of a green path through the wood, (the Old Wigmore Road), the Upper Ludlow rock is in many places exposed full of fossils, especially at the lower end, where there is a large quarry containing some very fine *Orthoceratites*. There is a small section of Aymestry limestone at the very top of the road, from whence may be procured several species of corals, also *Pentamerus Knightii* and many other shells.

About a mile and a half due west from Ludlow, on the Downton Castle road, close by a small stream that runs from the Fountain, is a large Upper Ludlow quarry, often worked for road metal, and consequently there is generally a quantity of weathered stone in the bottom. This is my favourite locality for procuring fossils peculiar to this formation; many scarce ones also occur here in a very perfect state of preservation. I find remains of *Ceratiocaris* most abundant here; portions of *Pterygotus* are also plentiful; the *Orthoceratites* are here of a large size, and I have found one or two heads of the scarce *Limuloides*. Mr. Lightbody procured here a small portion of *Pteraspis Ludensis*. The following may be obtained with a little trouble, along with very many others:—*Serpulites longissimus*, *Trachyderma coriacea*, *Discina striata* and *rugata*, *Orthis lunata* and *elegantula*, *Cardiola interrupta*, *Orthonota impressa*, *Goniophora cymbæformis*, *Cyclonema corallii*, and *Spirorbis Lewisii*. I would strongly recommend this place to those wishing to procure a general series of Upper Ludlow fossils.

RIDE No. I.

A little to the north of the railway station at Onibury, in the lane leading to Norton, is a large Downton sandstone quarry, from whence may be procured abundance of fucoidal impressions ; carbonaceous remains also abound, looking like pieces of charcoal, and are found loose in small cavities in the rocks. Fragments of fish, *Pterygotus* and *Eurypterus*, are also to be met with—occasionally a *Modiolopsis*—and Mr. Lightbody found a small portion of *Orthoceras*. This section may be plainly seen dipping in a direction under the Tin Mill Shale beds, which occur about a quarter of a mile higher up the lane, containing their characteristic fossils, and showing the junction with the Old Red beds overlying them. About a mile and a half further north, is the village of Norton, and in the Old Road there, at the back of Mrs. Bromley's farmhouse, is a small Downton sandstone quarry, from whence I procured, a few years ago, the underside of several nearly perfect fish heads, all of them very beautifully tuberculated. They occur in a stratum at the bottom of the rock, full of a white-coloured *Lingula cornea*, but I have been unable to procure any since, as the quarry is now abandoned, and nearly full of water. There are several other quarries near, containing traces of fish and crustaceans ; a small bivalve crustacean (*Leperditia marginata*) occurs in the upper beds. Nearly at the top of the lane leading to Mr. Bach's house, is a low cliff of Upper Ludlow rock upon the right-hand side, in which the bone bed is exposed of a greater thickness than in any other locality in which it has yet been observed, being here about eight inches thick. When I first discovered this bed, I asked a labourer if he had ever noticed it before. I showed it to him, and he said, "Yes ; it was a bed full of chopped straws," to which it bears some slight

resemblance. Dr. Harley, who has microscopically examined the bone bed near Ludlow, has shown that nearly one half of its fossil contents are fragments of crustaceans; he has also observed a minute kind of organism, the same as the *Conodonts* of Pander. The remainder are the usual fish defences or spines; portions of *Pteraspis*, and fish jaws with the teeth affixed to them, have also been found, but are rare. The Norton bone bed is overlaid by about three feet of Upper Ludlow rock. I have not observed either the *Pterygotus* or *Platyschisma* beds here. A very thin section of Downton covers the Upper Ludlow at this spot, containing *Lingula cornea*, and *Beyrichia Klodini*, which thickens out lower down, until, as in the quarry, at the lowest end of the lane, it is in sufficient quantity to be extensively worked for building purposes.

In the main road, about fifty yards from the bone bed, is a small quarry from whence I have collected *Homalonotus*, and it contains a stratum full of *Pterinea retroflexa*, very perfect; here, too, are found in the upper beds, occasional specimens of *Calymene Blumenbachii*, and frequently large *Lingulae* something like *L. Lewisii*. There are several other profitable sections near the village, containing an abundance of fossils.

RIDE No. II.

Near to Aymestry, a small village about ten miles from Ludlow, are several quarries of the limestone named after this village, containing the corals *Favosites alveolaris*, *Stenopera fibrosa*, *Petraia bina*, and *Palæocyclus porpita*; also the shells *Spirifer plicatellus* and *Athyris tumida*, besides nearly all the usual kinds.

This formation can be readily distinguished by the honeycomb structure of the face of the rock, where it has been exposed for some length of time, and is probably

caused by the calcareous fossils in the joints of the bedding being dissolved out by the action of the weather.

The road from Mortimer's Cross to Richard's Castle runs very nearly in the line of the junction of the Old Red sandstone and Upper Silurian ; in several places sections of rock are exposed.

Near the Spouthouse the same micaceous beds are to be seen resting on the Downton sandstone that are exposed near to Forge Bridge ; but all fossils excepting carbonaceous markings are very scarce there.

At Richard's Castle some fine sections of Downton sandstone are exposed, consisting of the lower beds of the formation ; and they may be traced downwards into the underlying rock, which is well exhibited all up the main road through the village.

The Downton sandstone (which is probably composed of the *debris* of the Carodoc sandstone) I would strongly recommend to the notice of geologists, as it has had but little examination. Most of the Silurian forms of life will be observed to have died out, and given place to others more nearly allied to the Old Red sandstone species.

RIDE No. III.

This ride is to Titterstone Clee Hill, from the summit of which is a most extensive and magnificent view. The sides of the hill are covered with large masses of loose basaltic rock that have rolled down from the top. Its columnar structure may be well seen near to the Giant's Chair, and at the terminus of the Clee Hill Railway, but at the latter place it is being rapidly broke up and carried away for road metal, for which purpose it makes one of the very best materials.

At the top of the Batch gutter several thin seams of coal are exposed, and there I have collected some very

pretty specimens of fossil ferns. A little lower down is a most instructive quarry, showing very peculiar stratification ; and all down the gutter is a fine section of the coal formation, and the underlying Old Red sandstone. In the shale thrown up from the numerous coal-pits, several fossil plants are to be procured, including *Sigillaria*, *Stigmara*, *Equisetum*, *Calamites*, and *Asterophyllites*. On this hill may be collected the ferns *Allosorus crispus*, *Lastrea dilatata*, *Osmunda regalis*, and many of the commoner kinds.

At Farlow, on the east side of Titterstone, in a yellow-coloured sandstone occupying the highest position of the Old Red, and rising out from beneath the carboniferous limestone, *Pterichthys* and *Holoptychius* remains, of several species, have been obtained. A fine collection of fish remains, chiefly palatal teeth, from that neighbourhood, is in the possession of Dr. Jones, of Cleobury Mortimer.

Near the Knowl Gate, on the Tenbury Road, are several large quarries of carboniferous limestone, but containing few fossils of much interest.

RIDE No. IV.

Near to Leysters Pole and Puddlestone, some very fine sections of Old Red cornstone are often worked, which contain the usual fish remains. They may be procured by a little perseverance. At Puddlestone the fish or crustacean tracts previously noticed as found at Bouldon, were first observed in a thin bedded sandstone, but they are not so numerous or so well preserved as at Bouldon, and, the stone being soft, they are liable to be rubbed in carriage.

On the road side, near to the Leysters, several species of *Polystichum* grow in great luxuriance.

RIDE No. V.

There are many sections of Upper Silurian rocks exposed near to the Corve Dale road; yet, as I have examined them but slightly, I cannot say what may be found there. I have no doubt but that they contain their usual fossil remains.

The turnpike road from Siefton, for some miles northward, runs nearly in the junction of the Old Red and Upper Ludlow; and I should think that a diligent search would probably find the Tin Mill shale and the Ludlow bone bed exposed in several places. Near Tugford and Abdon are several bands of cornstone, which are quarried in many places; and on the Brown Clee Hill are several old coal mines, not now worked. All this district has received but little attention from geologists.

RIDE No. VI.

All along the summit of Norton's Camp is a very grand section of Aymestry limestone; it is in general very unfossiliferous; the best locality is a little distance above Onibury Cottage, where it has been very extensively quarried.

A very interesting geological trip is up the side of the Onny river, commencing at Strefford's Bridge, which is about one mile from Craven Arms station. A short distance above the bridge, in the bed of the river, the Wenlock shale is exposed; and when the water is low, some very good specimens of *Phacops longicaudatus* can be procured. In the field immediately above the Cheney Longville foot-bridge, is the celebrated Onny section, a most interesting one, as the junction of the Upper and Lower Silurian occurs here; the bottom beds of the Wenlock (called the Purple Shale), the *Pentamerus*

limestone, or Upper Llandovery, and the Caradoc sandstone, are here all exposed in one continuous series.

From the Purple Shale have been collected *Cheirurus bimucronatus*, *Encrinurus punctatus* and *variolaris*, a new species of *Proetus*, *Orthis biloba*, *Beyrichia tuberculata*, *Leptaena lævigata* and *transversalis*, *Strophomena pecten*, *Atrypa reticularis*, and *Petraia bina*.

The Pentamerus limestone is here a very thin band, only two or three feet thick, and can only be reached when the water is very low. It occurs nearly in the very centre of the section.

The upper beds of the Caradoc sandstone (which formation belongs to the Lower Silurian series) are here very rich in interesting fossils; the best spot is immediately under a large tree growing out of the rock at the extreme west end of the cliff. There, portions of *Trinucleus concentricus* literally swarm, and many perfect ones have been obtained; also one entire specimen of a new species of *Ampyx*, and several fragments of *Illænus Davisii*, and *Remopleurides radians*. All shells are scarce at this place, but a little lower down, the rock is full of them; in many places they are so numerous that the stones have been burned for lime; they are then locally called "Jacob's stone."

A short distance higher up the river is a high cliff, and at this place was first found, by Professor Thompson, the curious fossil, *Sphærospongia hospitalis*. It has only yet been obtained from here in one narrow band. There are many species of shells here, and in good preservation.

A short distance from here is Longville Common, the side of which, facing the stream, is covered with blocks of stone (occupying the centre of the Caradoc sandstone); they are in general very barren; still, from them has been obtained *Asaphus Powisii*, *Homalonotus bisulcatus*, *Orthis spiriferoides*, *O. elegantula*, *O. testudinaria*, *Strophomena grandis*, *S. expansa*, *Bellerophon bilobata*,

B. acutus, *B. Murchisonia*, *Gyrogonia*, and *Modiolopsis orbicularis*. On crossing over the brook, by the stepping-stones, at the further end of the Common, a large quarry of Bala limestone is reached, upon the side of the turnpike road to Bishop's Castle, the beds of which are pitched up almost vertically, and they contain, along with many other organic remains, a new species of *Lingula*, in great numbers. On the lower side of the quarry, the very bottom beds of the Caradoc can be examined, and they are well worth hunting in, as they contain a great number of fossils, nearly every one of which is a new species not yet named.

The Longmynd Rocks, the lowest sedimentary formation, are exposed on a grand scale in many extensive sections on the hills from whence they take their name. These rocks were considered unfossiliferous until Mr. Salter discovered lately one specimen of what he believed to be a portion of a *Trilobite*, and named *Palæopyge Ramsayi* (I have been fortunate enough to find another small portion of this ancient crustacean), also two different species of *Annelides*, named by him *Arenicola didyma*, and *Arenicola sparsa*. The best preserved specimens of *Arenicola* are to be procured in some blue slaty stone close by a path winding round the Yearling Hill, a little distance above the stream that runs down the valley facing Little Stretton; there also are some very perfect impressions of rain drops and ripple markings. Mr. Salter found his *Trilobite* on the summit of the Round Hill; I found mine close to the Packet Stone, above Minton, both places lying on the same horizon of beds. The Caradoc conglomerate, which encircles the base of these hills, is composed of a multitude of angular stones from older formations, which were probably carried there by icebergs, and then being stranded along the edge of these primeval islands of the Longmynds, gradually melted and

deposited their burden at the bottom of the water. Near to Marsh Brook Station, and also near Acton Scott, and in all that district, are many quarries of Caradoc sandstone full of fossils, and containing an abundance of different forms, some of which are the following—*Tentaculites Anglicus*, *Phacops apiculatus*, *Asaphus Powisii*, *Phacops conophthalmus*, *Homalonotus bisulcatus*, *Lichas laxatus*, *Diplograpsus pristis*, numerous species of *Orthis*, *Strophomena grandis*, *S. expansa*, *S. alternata*, *Discina punctata*, *Ambonychia* sp., *Modiolopsis orbicularis*, *Bellerophon sulcatus*, *B. bilobata*, *Leptæna sericea*, *Lingula ovata*, *Theca triangularis*, *Raphistoma* sp., and *Holopea striatella*.

A very favourite quarry of mine is in the White Birches' Coppice, near to Marsh Brook, the upper beds of which are very full of fossils. From the side of the private road to Minton several specimens of a new *Trematis* have been collected, and several very perfect *Trilobites* from a small quarry by the side of the footpath leading to Acton Scott, the residence of Mrs. Stackhouse Acton, who takes great interest in geological pursuits, and has a splendid collection of British ferns growing in the grounds near the house.

On Burrow and Clunbury hills are several extensive sections of Ludlow rock exposed, most probably a part of the upper division. The stone is of a very hard, rough, nodular nature, and contains but few fossils to assist in deciding with certainty to which formation it belongs. These beds want and deserve a more minute examination, so that they may be positively placed in their right position.

At Shelderton and the View's Edge are several large quarries of Aymestry limestone containing very many fossils. At the latter is a bed of *Pentamerus Knightii* nearly 20 feet thick.

RIDE No. VIII.

There is a most splendid section exposed on the side of the turnpike road near Mocktree, where the Upper Ludlow, Aymestry limestone, and Lower Ludlow, lie conformable and continuous to each other. About the centre of this section is a very large quarry in which are to be found most of the Aymestry limestone forms. The beds here are of great thickness—at the least 200 feet—and many of them are full of *Pentamerus Knightii*, which may be obtained very perfect. I have found there the rather scarce coral *Nebulipora porpillata*. At the uppermost end of the quarry a very curious section is exposed. The lower beds are true Aymestry limestone, dipping at a slight angle to the north-west; the upper beds seem to have been scooped out into a hollow trough, and afterwards filled in with a fine mudstone deposit very similar in character to the upper beds of the underlying formation, and containing fossils identical in species to the Church Hill beds, which belong to the Lower Ludlow rocks. From these beds I have procured at least two different species of starfish, viz., *Protaster Leptosma*, and *P. vermiformis*, several species of *Ceraticaris* (a crustacean somewhat allied to the shrimps of the present age), *Pterygotus punctatus*, *Limuloides optatus*, a new species of *Spongarium*, *Phacops Downingii*, and several species of *Orthis*.

The lowest quarry of the Mocktree section is Lower Ludlow, from whence several of the fossils figured in "Siluria" were obtained; and as it is very often worked for building-stone there is generally plenty of material to hunt in. From the loose stones which have come from the top of the cliff, and have been thrown down the bank on the opposite side of the road, some very perfect fossils can be procured, as most of the stones have been exposed to the atmosphere for some years, which causes

them readily to split. Some very perfect *Phragmoceras* were procured here by the late Mr. H. Pardoe. Several of them are in the Ludlow Museum, to which he so liberally contributed his choicest specimens. From this locality may be obtained the following fossils, with many other common kinds:—*Ischadites Knoigii*, *Phacops caudatus*, *Euomphalus carinatus*, *E. alatus*, *Pleurotomaria undata*, *Murchisonia Lloydii*, *Lituities giganteus*, *Cardiola striata*, *C. interrupta*, *Pterinea retroflexa*, *P. Sowerbyi*, *Avicula mira*, *Pentamerus galeatus*, *Phragmoceras ventricosum*, *pyriformis*, and *compressum*, and very large portions of *Orthoceras ibex*, *angulatum* and *filosum*.

In a quarry on the side of the Old Road, about half a mile from Mocktree, the same beds are exposed, containing the same organisms that were described as occurring at the top of the Aymestry limestone quarry; but instead of occupying the summit of the rock, they consist of three bands of different thickness placed between thick masses of limestone full of *Pentamerus Knightii* and large corals. The most prolific layer is the uppermost one, in which a small *Ceratiocaris* occurs pretty plentifully, and a species of *Lichas*.

Nearly on the summit of Church Hill, and immediately facing Leintwardine, are several lower Ludlow quarries close together. The most prolific one is the uppermost, and nearest to the hedge, from whence starfish were first procured, and also where they occur in the greatest abundance. The beds are here very barren, except in particular layers, the starfish and other fossils lying in bands, very seldom with any intermixture of the species. I will now mention most of the fossils that have been found in this most interesting locality.

The oldest known fish swam in Churchill Bay, two or three specimens of *Pteraspis Ludensis* having been

found here. *Limuloides optatus* occur in the upper beds, associated with minute *Graptolites*, and also *Proetus Stokesii*, *Phacops Stokesii*, *Calymene tuberculosa*, and the Entomostracean, *Entomis taberosa*. A species of *Eurypterus* is found here, several of which have been obtained nearly entire; also large portions of *Pterygotus punctatus*, and *P. arcuatus*. Here also where first found Lower Ludlow *Encrinites*, many species of which have been procured, and also the first starfish from that formation, many of them most beautifully preserved. Several of the latter have been named by Mr. Salter, but there are many not yet so honoured. The following is a list of the named species:—*Protaster Miltoni*, *P. Leptosoma*, *P. vermiformis*, *P. anguilla*, *Palæcoma Marstoni*, *Colvini*, and *cygnipes*, *Rhopalocoma pyrotechnica*, *Palæodiscus ferox*, *Sphæraaster pomum*, *Palæstærina primæva*, and *Palæaster lina*. There is also found there *Ceratiocaris robustus*, *leptodactylus*, *cassia*, *Murchisonia*, *gigas*, and *princeps*, many different species of *Fucoids*, and I found one specimen of a very rare shell, *Macrocheilus elongata*. Is not this a glorious list of fossils, all found in one small quarry? Yet, besides these, there are many others, and new species are being discovered frequently. The neighbourhood of Leintwardine is a most fertile field for fossil collecting, as there are a great number of extensive sections of rock exposed near to the village, all of them full of most interesting remains.

The last locality I shall mention is near to Pedwardine, where there is an upheaval of the upper *Lingula* flags, containing *Dictyonema sociale*, and a minute *Lingulella*.

This ride finishes my brief description of the geological localities best worth examining in the different rides and walks round Ludlow. I have, I trust, mentioned all the best places; but as the space allowed me is very

limited, I have been obliged to leave out many well worth visiting. Indeed every bit of rock that shows itself in this neighbourhood deserves notice. Fossils abound everywhere, but perhaps not in such numbers, or in such choice specimens, as at the places I have described.

One of the great charms to me in fossil collecting is, that we never know what we may not find. A single blow of the hammer may bring to light an entirely new species, a new medal of past life, that lived during the vast ages that preceded man's existence on the globe.

From the age of the formation of the lowest sedimentary rock up to that of the highest, life has existed upon the earth; and from the dawn of creation to the present age there has been a gradual progression of species, some races of beings dying out to give place to others of a higher order, until at length man, the last and most finished of the Almighty's works, appeared upon the scene, endowed with a mind capable of understanding a few of the wonderful things revealed by each medal of creation that is stored up in the book of nature, and there waiting his enquiries. Yet man's time will surely come—he will also perish; but we may be sure, from what geology teaches us, that something superior will arise after him, which may be man in his perfect condition, in as near an approach to God as created can be to the Creator; then this will end the scroll of time—this will be the finishing stroke to geology.

"Fair Nature, thee with all thy various charms,
I'll fondly press, and clasp within my arms."



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